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# Data Catalog of Satellite Experiments

Supplement No. 2c to NSSDC 71-20

OCTOBER 1974

Astronomy and Solar Physics



NATIONAL SPACE SCIENCE DATA CENTER

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.

NSSDC 74-15c

NATIONAL SPACE SCIENCE DATA CENTER  
DATA CATALOG OF SATELLITE EXPERIMENTS

*ASTRONOMY AND SOLAR PHYSICS*

SUPPLEMENT NO. 2c to NSSDC 71-20

- - -

Technical Coordinator

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October 1974

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\*Because of the number of entries in this section, only the spacecraft and experiments are listed here.

## INTRODUCTION

### Purposes and Organization

The purposes of the Data Catalog of Satellite Experiments are to announce the availability of experimental space science data, to describe these data, and to inform potential users of the policies and procedures associated with the data dissemination services provided by the National Space Science Data Center (NSSDC). The space science experiment data available as of June 1973 are described in the Data Catalog of Satellite Experiments, December 1971 (NSSDC 71-20), and its supplement, October 1973 (NSSDC 73-11).

Beginning with this issue, a new concept for announcing the availability of data at NSSDC has been adopted. This concept is based upon the Selective Dissemination of Information (SDI) principle. Under the NSSDC SDI system, the types of satellite experiment data acquired have been divided into the following eight major discipline categories: Astronomy, Geodesy and Gravimetry, Ionospheric Physics, Meteorology, Particles and Fields, Planetary Atmospheres, Planetology, and Solar Physics. The Data Center definitions of these categories are provided on the inside front cover. (It should be noted that these category definitions reflect the best judgment of the NSSDC staff and are not intended as definitive descriptions of discipline boundaries.) The current issue of the catalog has been published in four volumes. One volume covers the categories of Astronomy and Solar Physics. Another combines the categories of Ionospheric Physics, Meteorology, and Planetary Atmospheres. Particles and Fields constitutes one separate volume, and Planetology, another separate volume. The few experiments which fall under more than one category have been included in each of the relevant discipline volumes. Generally, each volume describes only those data sets and associated spacecraft and experiments not included in the 1971 or 1973 issues of the catalog and are currently suitable for announcement. Additionally, the volumes may contain descriptions of data sets previously announced for which sufficient quantities of new data have been acquired to merit their inclusion.

Cumulative volumes for the discipline categories will be prepared in spring 1975. An index volume will also be prepared at that time that will be sent to all participants in the SDI system. This volume will contain indexes by Spacecraft Name, Investigator Name, Original Experiment Institution and/or Current Experiment Institution, and Phenomenon Measured for all data included in any of the discipline volumes. Also included will be descriptions of spacecraft from which NSSDC has acquired data, as well as descriptions of ephemeris or other special spacecraft-related data sets appropriate for announcement.

Each index will refer to the discipline volumes in which the description of the experiment or its associated data set can be found. The index volume alone may satisfy the needs of many users; in addition, subject volumes in the various categories will be sent automatically to users who have expressed an interest in any category in that volume. Subject volumes will be available to others on special request.

### Data Availability, Costs, and Ordering Procedures

The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science experiments in support of additional studies beyond those performed by the principal investigators. Therefore, NSSDC will provide data and information upon request to any individual or organization resident in the United States. In addition, the same services are available to scientists outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S). Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The requester will be notified of the cost, and payment must be received prior to processing the request. The Director of NSSDC may waive, as resources permit, the charge for modest amounts of data when they are to be used for scientific studies, or for specific educational purposes, and when they are requested by an individual affiliated with:

1. NASA installations, NASA contractors, or NASA grantees
2. Other U.S. Government agencies, their contractors, or their grantees
3. Universities and colleges
4. State and local governments
5. Nonprofit organizations

A user may obtain data in any of the following ways:

1. Letter request
2. Data Request Form (contained at the end of this document)
3. Telephone request
4. On-site visit

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Anyone who wishes to obtain data for a scientific study should specify the NSSDC identification number, the common name and/or number of the satellite and the experiment, the form of data, and the time span (or location, when appropriate) of data requested. A requester should also specify why the data are needed, the subject of his work, the name of the organization with which he is affiliated, and any Government contracts he may have for performing his study. Upon special request, data may be provided in a medium other than that noted in the heading of the data set descriptions. For example, computer printout or microfilmed listings could be produced from magnetic tape data sets. Enlarged paper prints are available from data sets on photographic film and microfilm. The Data Center will provide the requester with an estimate of the response time and cost that will be incurred for such requests, if appropriate.

When requesting data on magnetic tape, the user should specify whether he will supply new tapes prior to the processing, return the original NSSDC tapes after the data have been copied, or pay for new tapes.

The Data Center's official address for requests is:

National Space Science Data Center  
Code 601.4  
Goddard Space Flight Center  
Greenbelt, Maryland 20771

Phone: 301 982-6695

Users who reside outside the U.S. should direct requests for data to:

World Data Center A for Rockets and Satellites  
Code 601  
Goddard Space Flight Center  
Greenbelt, Maryland 20771 U.S.A.

Phone: 301 982-6695

Since WDC-A-R&S also maintains listings of rocket experiments, requests for information concerning rocket launchings and the experiments flown may be directed to this institution.

## NSSDC Facilities and Services

NSSDC provides facilities for reproduction of data and for on-site data use. Resident and visiting scientists are invited to study the data while at the Data Center. The Data Center staff will assist users with additional data searches and with the use of equipment. In addition to satellite and space probe data, the Data Center maintains some correlative data and information on other correlative data that may be related to a specific request. These correlative data are described in the NSSDC Handbook of Correlative Data, NSSDC 71-05, which is available from the Data Center.

In addition to its main function of providing selected data and supporting information for further analysis of space science flight experiments, the Data Center produces a wide spectrum of publications. Among these are a report on active and planned spacecraft and experiments, a report of recent sounding rocket launchings, and lunar and planetary photographic catalogs and users guides. For additional information on NSSDC and WDC-A-R&S document availability and distribution services, write to the appropriate address identified in the previous section and ask for document NSSDC/WDC-A-R&S 74-10.

## Participation

The National Space Science Data Center (NSSDC) invites members of the scientific community to contribute data from satellite experiments. NSSDC assigns a specialist in the appropriate scientific discipline for each experiment to arrange for data acquisition with the principal investigator and to help solve related problems. Acquired data are cataloged and made available to users according to established procedures. Scientists who have not been contacted by one of the subject specialists and who have analyzed or reduced data available for contribution are requested to contact NSSDC so that transfer of the data may be arranged.

The Data Center is continually striving to increase the usefulness of the data catalog by improving the data descriptions and including all pertinent information. Scientists are invited to submit their comments or recommendations to NSSDC regarding the data available, the services provided, and the contents and format of the catalog. Recipients are urged to inform potential data users of its availability. Anyone wishing to receive a copy of this publication can have his name added to this distribution list by phone or letter request.

## Abbreviations and Acronyms

The abbreviations and acronyms used in this volume are listed in the October 1973 supplement (NSSDC 73-11) to the data catalog.

## DESCRIPTION OF DATA

### General

This section was produced from the computerized NSSDC information system, which provides the Data Center with an efficient means for maintaining up-to-date descriptions of available data and for announcing the acquisition of new data. For each data set\* description contained in the information system, descriptions of the experiment and spacecraft from which the data originated are also included as background information. This section is organized by spacecraft common name and within that by the last name of the principal investigator associated with each experiment on that spacecraft. Data set descriptions follow the experiments to which they pertain and are ordered by NSSDC ID code which appears in the upper right-hand corner of the description.

### Identification of Spacecraft, Experiments, and Data Sets

In the NSSDC information system, each spacecraft, experiment, and data set is assigned an identification number, the NSSDC ID No., that is based on the launch sequence of the spacecraft. Subsequent to 1962, the NSSDC ID No. for a spacecraft (e.g., 65-042A for Explorer 28) corresponds to the COSPAR (Committee on Space Research) international designation. The Data Center has provided corresponding numbers for satellites that were launched during the years 1957 to 1962. (For example, Explorer 1, which carries COSPAR designation 1958 Alpha 1, was the first spacecraft launched in 1958; therefore, it has been assigned NSSDC ID No. 58-001A.) The experiment and data set ID numbers are based on the spacecraft number. For example, the experiments carried aboard spacecraft 67-031A (ATS 2) are numbered 67-031A-01, 67-031A-02, etc. Data sets derived from experiment 67-031A-01 are designated 67-031A-01A, 67-031A-01B, etc.

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\*A data set is defined as (1) a body of data that is the result of the reduction or analysis of data from a given experiment or (2) certain supporting information (catalogs, ephemeris, etc.) that is uniquely related to a given experiment or spacecraft. The content, characteristics, form, format, or organization of this body of data is different from that of any other body of data or supporting information associated with the given experiment or spacecraft.



## Spacecraft, Experiment, and Data Set Descriptions

Each entry in this section is composed of two parts -- a heading and a brief description. Each type of entry (i.e., spacecraft, experiment, and data set) contains its own heading. The headings list generic characteristics of satellites, experiments, and data sets. Details on the contents of the three kinds of entries are described in the following paragraphs.

### Contents of Spacecraft Entries

The heading for each spacecraft description contains the following information about the spacecraft: launch date, spacecraft weight in orbit, spacecraft status of operation, and, for inoperable or operationally off spacecraft, the date last spacecraft data were recorded or, if available, the date last usable spacecraft data were recorded. Orbiting spacecraft also have the following orbital parameters included in the heading: epoch date, orbit type, orbit period, apoapsis and periapsis (distance from the surface of the reference body to the furthest and nearest orbit points, respectively), and inclination (the angle between the satellite orbital plane and the equatorial plane of the primary gravitational body). For satellites with heliocentric orbits, the ecliptic plane is used in lieu of the equatorial plane.

Each spacecraft brief description contains a concise summary of the spacecraft mission, specifically outlining the overall objectives of the mission and the scientific studies being performed. Information about the operational performance and status of the spacecraft during a given period of time also is included and is frequently updated. In some cases the performance and status information reflected in the description may disagree with information found in the heading under "Status of Operation." When there are disagreements, consider the information in the heading as more up to date.

### Contents of Experiment Entries

Each experiment entry heading lists the name of the original experiment institution and the name and address of the principal investigator for the experiment. The names and addresses of other investigators associated with the experiment are also listed. The status of operation of the experiment is then listed as "normal," "partial," "operational off," or "inoperable." For inoperable or operationally off experiments, the date last experiment data were recorded or, if available, the date last usable experiment data were recorded, are also presented. In addition, if the experiment is functioning in other than a normal mode, the brief description explains the circumstances of, and periods affected by, the change.

The experiment brief description contains a concise summary of the experiment purpose and instrument characteristics, emphasizing those relevant to the scientific use of the resulting data. Information about the operational performance and status of the experiment during a given period of time also is included and is frequently updated. In some cases the performance and status information reflected in the description may disagree with information found in the heading under "Status of Operation." When there are disagreements, consider the information in the heading as more up to date.

#### Contents of Data Set Entries

Each data set entry contains three elements in the heading: the time period covered by the data, the quantity of data and medium on which the data are stored, and an indicator describing the availability of the data. The time period covered is annotated with one of two additional comments: (1) "as verified by NSSDC" - identifying that portion of the data set for which the period of data coverage has been verified, and (2) "as reported by the experimenter" - identifying the period of coverage provided by the experimenter, regardless of the amount held or verified by NSSDC. Several indicators are used to describe the status of data availability to requesters:

- . Data at NSSDC Ready for Distribution - designates a data set for which cataloging, verification, and documentation are sufficient to provide a comprehensible set of data to satisfy requests.
- . Data in Published Reports - indicates either that all or a significant portion of the data are contained in a published report or journal, or that the only accessible source of any reduced data from an experiment is the published document. The publications cited in the brief descriptions for spacecraft, experiment, or data set entries normally are available through scientific libraries or document distribution centers. NSSDC provides copies of publications only if they cannot be obtained through such libraries or centers.
- . Data at NSSDC - identifies data sets for which documentation and verification activities are in process. These data are usually sufficiently documented and verified to satisfy routine requests.

- . Data at NSSDC Processing Deferred - indicates that the verifying, documenting, or cataloging of the data set is not complete, and that no additional work will be performed unless specifically requested. NSSDC may be able to supply the data from such a data set in a suitable form, depending upon the completeness of the processing and documentation and the particular requirements of the user. The completeness of the data set is indicated in its brief description.
- . Data Available from Experimenter - is used for data sets that NSSDC does not plan to acquire, and that the experimenter is willing to make available to other scientists, usually in limited amount. These data sets are not feasible for storing at NSSDC, either because they are large in volume or because they require special equipment to process. Requests for data sets carrying this indicator should be addressed directly to the experimenter. The experimenter's name and address and the expected date that the data will be ready for processing are given in the brief description of such a data set.
- . Data at Another Center - is used for data sets stored and distributed by any other data center. Requests for data sets with this indicator should be made directly to the organization identified in the brief description.
- . Data at Another Center that NSSDC can Process - denotes a data set held by another data center but to which NSSDC has access for limited processing. Requests for this type of data set should be submitted to NSSDC.

For information on the procedures for ordering the data described herein, please refer to page vi in the Introduction.

NATIONAL SPACE SCIENCE DATA CENTER  
DATA CATALOG OF SATELLITE EXPERIMENTS  
ASTRONOMY AND SOLAR PHYSICS

SUPPLEMENT NO. 2C TO NSSDC 71-20

\*\*\*\*\*APOLLO 14 LM/ALSEP \*\*\*\*\*

SPACECRAFT COMMON NAME- APOLLO 14 LM/ALSEP NSSDC ID 71-008C  
ALTERNATE NAMES- ALSEP 14, LEM 14, 04905, APOLLO 14C

LAUNCH DATE- 01/31/71 SPACECRAFT WEIGHT IN ORBIT- 4857. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

SPACECRAFT BRIEF DESCRIPTION

THE APOLLO 14 LUNAR MODULE (LM) CONSISTED OF A LUNAR LANDING CRAFT AND AN APOLLO LUNAR SURFACE EXPERIMENT PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS TO BE LEFT ON THE LUNAR SURFACE AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE LUNAR HIGHLANDS (3 DEG 39 MIN SEC S LATITUDE, 17 DEG 27 MIN 55 SEC W LONGITUDE). THE NUCLEAR POWERED ALSEP WAS DEPLOYED AT THE LANDING SITE AND INCLUDED EXPERIMENTS TO STUDY THE SEISMIC WAVES, MAGNETIC FIELDS, SOLAR WIND COMPOSITION AND INTERACTION WITH THE MOON, LUNAR ATMOSPHERE, IONIC ENVIRONMENT, HIGH-ENERGY RADIATION DATA TO SOLAR CELLS, LUNAR MOTION, AND THE LUNAR SOIL.

\*\*\*\*\*APOLLO 14 LM/ALSEP, FALLER

EXPERIMENT NAME- LASER RANGING RETROREFLECTOR NSSDC ID 71-008C-09

ORIGINAL EXPERIMENT INSTITUTION- CONN. WESLEYAN U

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)  
PI - J. FALLER CONN. WESLEYAN U MIDDLETOWN, CT

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE PURPOSE OF THIS EXPERIMENT WAS TO PERMIT GROUND-BASED STATIONS TO CONDUCT SHORT-PULSE LASER RANGING TO A CORNER REFLECTOR ARRAY ON THE LUNAR SURFACE AT THE FRA MAURO SITE. THIS INSTRUMENT AND THOSE AT APOLLO 11 (TRANQUILITY BASE) AND AT THE APOLLO 15 SITE IN THE MADLEY/APENNINE REGION PROVIDED A NETWORK (WELL-SEPARATED IN LONGITUDE AND LATITUDE) OF STATIONS TO PERMIT A COMPLETE GEOMETRICAL SEPARATION OF THE LUNAR LIBRATIONS. THE REFLECTORS PERMITTED A DISCRIMINATION OF THE 3-YR PHYSICAL LIBRATIONS. THEY ALSO PROVIDED INFORMATION ABOUT THE EARTH AND ITS CONTINENTAL DRIFT MOTIONS AS WELL AS VERY ACCURATE DETERMINATIONS OF THE EARTH-MOON DISTANCE AND THE MOON'S ORBITAL MOTIONS. THE EARTH'S NORTH POLE POSITION COULD BE DETERMINED TO PLUS OR MINUS 15 CM. THE INSTRUMENT WAS AN ARRAY OF 100 SMALL FUSED-SILICA CORNER CUBES EACH 3.8 CM IN DIAMETER. IT WAS DEPLOYED ON THE FIRST EVA, 30 M WEST OF THE CENTRAL STATION (200 M WEST OF THE LM), WAS LEVELED, AND WAS FACED TOWARD THE EARTH. EACH CORNER CUBE REFLECTED LIGHT PARALLEL TO THE INCIDENT DIRECTION, ENSURING THAT THE REFLECTED LASER PULSE RETURNED TO ITS PLACE OF ORIGIN ON THE EARTH. SUCCESSFUL RANGE MEASURES WERE FIRST OBTAINED FROM THE MCDONALD OBSERVATORY IN TEXAS ON FEBRUARY 5, 1971. THE DAY THE EXPERIMENT WAS DEPLOYED, NO DEGRADATION WAS SUFFERED FROM THE LM LIFTOFF.

DATA SET NAME- FILTERED AND UNFILTERED LASER PHOTON DETECTIONS ON MAGNETIC TAPE NSSDC ID 71-008C-09A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 02/05/71 TO 12/29/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 5 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 800-BPI, BINARY, 7-TRACK TAPES CONTAINING DATA ON THE CURRENT DEPOSITION FROM THE LUNAR LASER RANGING EXPERIMENTS ON APOLLOS 11 AND 14. THERE ARE SEVEN FILES OF DATA -- (1) FILTERED DATA FROM NOVEMBER 1969 THROUGH DECEMBER 1970, (2) UNFILTERED DETECTIONS FOR NOVEMBER-DECEMBER 1969, (3) UNFILTERED DETECTIONS FOR JANUARY-JUNE 1970, (4) UNFILTERED DETECTIONS FOR JULY-DECEMBER 1970, (5) UNFILTERED DETECTIONS FOR JANUARY-DECEMBER 1971, (6) FILTERED DATA FOR JULY-DECEMBER, 1972, AND (7) UNFILTERED DATA FOR JANUARY-JULY, 1973. THE DATA WERE WRITTEN ORIGINALLY ON A CDC 6600 COMPUTER. THERE ARE TWO DIFFERENT KINDS OF DATA -- RUN DATA, WHICH ARE DESIGNATED BY A 'Z', AND SHOT DATA, DESIGNATED BY A 'P' IN THE BEGINNING OF EVERY 80-CHARACTER LOGICAL RECORD. THIS TAPE IS BLOCKED AT 64 LOGICAL RECORDS PER PHYSICAL RECORD. EACH PHYSICAL RECORD HAS FOUR CHARACTERS THAT WERE APPENDED AFTER THE TAPE WAS DUPLICATED ON THE IBM 7094 COMPUTER. FILTERED DATA CONSIST OF PHOTON DETECTIONS SUBMITTED TO A DATA FILTERING PROCEDURE ASSUMING LINEARITY OF C RESIDUALS OVER A RELATIVELY SHORT TIME INTERVAL AND RELYING ON POISSON STATISTICS FOR THE LEVEL OF CONFIDENCE IN A COLLECTION IDENTIFIED BY THE FILTER. UNFILTERED DATA ARE REAL-TIME DATA HEAVILY INTERSPERSED WITH NOISE PHOTONS FROM ANY OF THE VARIOUS SOURCES OF STRAY LIGHT. AN ATTEMPT TO USE THE DATA IN A SIMPLE GAUSSIAN APPLICATION WOULD RESULT IN A SOLUTION CLOSELY ADHERING TO THE PREDICTION EPHEMERIS USED TO CONTROL THE DETECTOR RANGE GATING. SOME FILTERING PROCESS MUST BE APPLIED TO THE DATA FOR EFFECTIVE USE. THE DATA RECORDED ARE JULIAN DATE, CLOCK ERROR, AMBIENT TEMPERATURE, AMBIENT RELATIVE HUMIDITY AND PERCENT OF SATURATION, WIND SPEED, LASER ENERGY IN JOULES X10, LASER FREQUENCY IN HZ X1E10, PULSE LENGTH IN SECX1E10, OBSERVATIONAL RESOLUTION, PHOTOMULTIPLIER DARK COUNT, MOON COUNT RATE, STAR COUNT RATE, CALIBRATION STAR IDENTIFICATION, FILTER SPECTRAL WIDTH, FILTER SPATIAL WIDTH, NUMBER OF SHOTS FIRED THIS RUN, YEAR, MONTH, AND DAY.

\*\*\*\*\*APOLLO 15 LM/ALSEP \*\*\*\*\*

SPACECRAFT COMMON NAME- APOLLO 15 LM/ALSEP NSSDC ID 71-063C  
ALTERNATE NAMES- APOLLO 15C, ALSEP 15, LEM 15, ROVER 15, 05366

LAUNCH DATE- 07/26/71 SPACECRAFT WEIGHT IN ORBIT- 12700. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

SPACECRAFT BRIEF DESCRIPTION

THE APOLLO 15 LUNAR MODULE (LM) CONSISTED OF A LUNAR LANDING CRAFT, A LUNAR ROVING VEHICLE (LRV), AND AN APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS TO BE LEFT ON THE MOON AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE NORTH CENTRAL PART OF THE MOON (26 DEG 4 MIN 54 SEC N LATITUDE, 3 DEG 39 MIN 30 SEC E LONGITUDE), AT THE FOOT OF THE APENNINE MOUNTAIN RANGE. THE ALSEP WAS DEPLOYED AT THE LANDING SITE. THE LRV WAS USED DURING THE EXTRAVEHICULAR

ACTIVITIES (EVA) TO EXTEND THE RANGE OF MANNED LUNAR EXPLORATION. THE NUCLEAR-POWERED ALSEP CONTAINED SEISMIC, MAGNETIC FIELDS, LUNAR ATMOSPHERIC COMPOSITION, ICA COMPOSITION, LUNAR DUST, SOLAR WIND COMPOSITION, HEAT LOSS, AND SOLAR CELL RADIATION DAMAGE EXPERIMENTS.

\*\*\*\*\*APOLLO 15 LM/ALSEP, FALLER

EXPERIMENT NAME- LASER RETROREFLECTOR

NSSDC ID 71-063C-08

ORIGINAL EXPERIMENT INSTITUTION- WESLEYAN U

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - J. FALLER OI - CONN WESLEYAN U MIDDLETOWN, CT

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE LASER RANGING RETROREFLECTOR EXPERIMENT (LRRR), PART OF THE ALSEP PACKAGE, WAS A CORNER REFLECTOR FOR LASER RANGING FROM EARTH. THE RANGING DATA OBTAINED INCLUDED INFORMATION ON LUNAR MOTION, LUNAR LIBRATIONS, AND EARTH ROTATION. THE LRRR EXPERIMENT CONSISTED OF A FOLDED PANEL STRUCTURE INCORPORATING 700 INDIVIDUAL FUSED-SILICA OPTICAL CORNER REFLECTORS, A SIMPLE ALIGNMENT/LEVELING DEVICE, AND AN AIM-HANDLE MECHANISM. THE LUNAR ROVING VEHICLE (LRV) WAS USED TO CARRY THE LRRR TO THE HADLEY RILL SITE. THE LRRR BECAME PASSIVE AFTER DEPLOYMENT. A HASSELBLAD ELECTRIC DATA CAMERA (60-MM LENS) WAS USED TO PHOTOGRAPH THE EXPERIMENT. THE LRRR CAN BE USED INDEFINITELY AND WILL PROVIDE DATA THAT, WHEN USED IN CONJUNCTION WITH DATA FROM THE APOLLO 11 AND 14 LRRR EXPERIMENTS, WILL PERMIT MORE REFINED DISTANCE MEASUREMENTS THAN WERE PREVIOUSLY AVAILABLE. NOW SMALLER TELESCOPES CAN BE USED THAN PREVIOUSLY WERE NEEDED, THUS PROVIDING MORE DATA AND INCREASING THE ACCURACY.

DATA SET NAME- FILTERED AND UNFILTERED PHOTON DETECTIONS NSSDC ID 71-063C-08A  
ON MAGNETIC TAPE

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 07/26/71 TO 12/25/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 800-BPI, BINARY, 7-TRACK MAGNETIC TAPES CONTAINING DATA ON THE CURRENT DEPOSITION FROM THE LASER RANGING RETROREFLECTOR EXPERIMENTS FROM APOLLOS 11, 14, AND 15. THE TWO TYPES OF DATA, FILTERED DATA AND UNFILTERED DETECTIONS WERE RECORDED ORIGINALLY ON A CDC 6600 COMPUTER. THERE ARE TWO DIFFERENT KINDS OF DATA -- RUN DATA, WHICH ARE DESIGNATED BY A 'Z' IN THE BEGINNING OF EVERY 80-CHARACTER LOGICAL RECORD, AND SHOT DATA, WHICH ARE DESIGNATED BY A 'P' IN THE BEGINNING OF EVERY 80-CHARACTER LOGICAL RECORD. THE TAPE IS BLOCKED AT 64 LOGICAL RECORDS PER PHYSICAL RECORD. EACH PHYSICAL RECORD HAS FOUR CHARACTERS WHICH WERE APPENDED AFTER THE TAPE WAS DUPLICATED ON AN IBM 7094 COMPUTER. FILTERED DATA CONSIST OF PHOTON DETECTIONS SUBMITTED TO A DATA FILTERING PROCEDURE THAT ASSUMES LINEARITY OF C RESIDUALS OVER A RELATIVELY SHORT TIME INTERVAL AND RELIES ON POISSON STATISTICS FOR THE LEVEL OF CONFIDENCE IN A COLLECTION IDENTIFIED BY THE FILTER. UNFILTERED DATA ARE REAL-TIME DATA, HEAVILY INTERSPERSED WITH NOISE PHOTONS FROM VARIOUS SOURCES OF STRAY LIGHT. ANY ATTEMPT TO USE THE DATA IN A SIMPLE GAUSSIAN APPLICATION WOULD RESULT

IN A SOLUTION CLOSELY ADHERING TO THE PREDICTION EPHEMERIS USED TO CONTROL THE DETECTOR RANGE GATING. SOME FILTERING PROCESS MUST BE APPLIED TO THE DATA FOR EFFECTIVE USE. THE DATA RECORDED ARE JULIAN DATE, CLOCK ERROR, AMBIENT TEMPERATURE, AMBIENT RELATIVE HUMIDITY AND PERCENT OF SATURATION, WIND SPEED, LASER ENERGY IN JOULES X10, LASER FREQUENCY IN HZ X1E10, PULSE LENGTH IN SEC X1E10, OBSERVATIONAL RESOLUTION, PHOTOMULTIPLIER DARK COUNT, MOON COUNT RATE, STAR COUNT RATE, CALIBRATION STAR IDENTIFICATION, FILTER SPECTRAL WIDTH, NUMBER OF SHOTS FIRED THIS RUN, YEAR, MONTH, AND DAY.

\*\*\*\*\*APOLLO 16 CSM

\*\*\*\*\*

SPACECRAFT COMMON NAME- APOLLO 16 CSM  
ALTERNATE NAMES- 06000

NSSDC ID 72-031A

LAUNCH DATE- 04/16/72 SPACECRAFT WEIGHT IN ORBIT- 48606. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE  
DATE LAST USABLE SPACECRAFT DATA RECORDED- 04/27/72

EPOCH DATE- 04/20/72 ORBIT TYPE- SELENOCENTRIC ORBIT PERIOD- 120. MIN  
APOAPSIS- 120. KM ALT PERIAPSIS- 54. KM ALT INCLINATION- 12. DEG

#### SPACECRAFT BRIEF DESCRIPTION

APOLLO 16 WAS THE FIFTH MISSION IN THE APOLLO SERIES IN WHICH MEN LANDED ON THE MOON. THE 11-DAY SCIENTIFIC MISSION BEGAN ON APRIL 16, 1972, AT 1754 UT. (THE LAUNCH WAS POSTPONED FROM THE ORIGINALLY SCHEDULED DATE, MARCH 17, DUE TO A DOCKING RING JETTISON MALFUNCTION.) NAVY CAPTAIN JOHN W. YOUNG AND AIR FORCE LIEUTENANT CHARLES W. DUKE LANDED ON THE LUNAR SURFACE IN THE LUNAR MODULE (LM) ON APRIL 21. NAVY LIEUTENANT THOMAS K. MATTHEWS REMAINED IN THE COMMAND MODULE (CM) PERFORMING SCIENTIFIC EXPERIMENTS WHILE THE CM WAS IN AN EQUATORIAL ORBIT ABOUT THE MOON. THE LM LANDED IN THE DESCARTES REGION OF THE MOON AT APPROXIMATELY 16 DEG E, 9 DEG S. AN APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) WAS DEPLOYED ON THE SURFACE. TERRAIN SAMPLES WERE ACQUIRED, AND PHOTOGRAPHS WERE OBTAINED BY THE SURFACE ASTRONAUTS AND FROM THE CM USING 16-, 35-, AND 70-MM FILM, 5-BY 5-IN. PANORAMIC FILM, AND 5-IN. MAPPING FILM. THE SURFACE ASTRONAUTS ALSO TESTED THE SECOND LUNAR ROVING VEHICLE TO BE TAKEN TO THE MOON BY EXPLORING REGIONS WITHIN 4 KM OF THE LM LANDING SITE. A SUBSATELLITE CARRYING AN EXPERIMENT PACKAGE WAS LAUNCHED INTO LUNAR ORBIT ON APRIL 24, 1972, AND IMPACTED WITH THE MOON AFTER 425 REVOLUTIONS ON MAY 29, 1972. THE CM AND LM REJOINED AND THE CM RETURNED TO EARTH, LANDING IN THE PACIFIC OCEAN ON APRIL 27, 1972.

\*\*\*\*\*APOLLO 16 CSM, DOYLE

EXPERIMENT NAME- MAPPING CAMERA ASPECT STELLAR  
PHOTOGRAPHY

NSSDC ID 72-031A-04

ORIGINAL EXPERIMENT INSTITUTION- US GEOLOGICAL SURVEY

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)  
PI - F.J. DOYLE US GEOLOGICAL SURVEY MCLEAN, VA

EXPERIMENT STATUS OF OPERATION- INOPERABLE  
DATE LAST USABLE EXPERIMENT DATA RECORDED- 04/26/72

#### EXPERIMENT BRIEF DESCRIPTION

THE PURPOSE OF THIS EXPERIMENT WAS TO PROVIDE ACCURATE ATTITUDE DATA FOR THE MAPPING (METRIC) CAMERA PHOTOGRAPHY AND LASER ALTIMETER DATA. THE STELLAR CAMERA HAD A 76-MM (3-INCH) FOCAL LENGTH AND USED 3401 (VHSW) B/W FILM. THE CAMERA OPERATED SIMULTANEOUSLY WITH THE METRIC CAMERA AND LASER ALTIMETER, PHOTOGRAPHING THE STELLAR BACKGROUND WHILE THE METRIC CAMERA AND LASER OBSERVED THE LUNAR SURFACE. THE STELLAR CAMERA WAS MOUNTED AT A 96-DEG ANGLE TO THE METRIC CAMERA. THE COMPOSITE SYSTEM OPERATED AUTOMATICALLY. THE STELLAR CAMERA AND LASER ALTIMETER COULD BE DECOUPLED FROM THE METRIC CAMERA AND OPERATED TOGETHER, INDEPENDENTLY FROM THE METRIC CAMERA, SO THAT PHOTOGRAPHS OF THE EARTHSHINE AREAS COULD BE OBTAINED, WHEREAS THE METRIC CAMERA OBTAINED ONLY THE DAYSIDE TARGETS. THE WHOLE UNIT WAS MOUNTED IN THE SIM BAY OF THE CSM. THE LASER TELESCOPE CONTAINED OPTICS FOR ITS TRANSMITTER AND RECEIVER OPERATING AT A WAVELENGTH OF 6943 Å (NOMINAL). THE TRANSMITTER BEAM WAS 300 MICRORADIANS, AND THE RECEIVER FIELD OF VIEW (FOV) WAS 200 MICRORADIANS. THE STELLAR CAMERA OPERATED NOMINALLY, BUT THE GLARESHIELD JAMMED AND INTRODUCED GLARE INTO THE STELLAR PHOTOS, WHICH COMPLICATED THE STAR FIELD DATA REDUCTION.

DATA SET NAME- MAPPING CAMERA STELLAR PHOTOGRAPHY ON NSSDC ID 72-031A-04A  
70-MM MASTER POSITIVE FILM

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/21/72 TO 04/26/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3561 FRAMES

#### DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF THE COMPLETE SET OF THE MAPPING STELLAR CAMERA PHOTOGRAPHY FROM JSC. THE STELLAR IMAGERY IS GENERALLY VERY GOOD, ALTHOUGH SOME FRAMES CONTAIN STATIC MARKS. OTHER FRAMES HAVE FOG OR LIGHT LEAKS. THE DENSITIES ARE AFFECTED BY THE LIGHT LEVELS UNDER WHICH THEY WERE EXPOSED. STAR IMAGES ARE THOSE UNAFFECTED BY ATMOSPHERE. STAR FRAME NUMBERS DO NOT CORRESPOND TO THE MAPPING CAMERA FRAME NUMBERS, EVEN THOUGH THEY WERE SIMULTANEOUSLY EXPOSED. THE USER SHOULD ADD 79 TO THE MAPPING FRAME NUMBERS TO FIND THE FRAME NUMBER OF THE STAR FIELD ASSOCIATED WITH THAT MAPPING FRAME.

\*\*\*\*\*APOLLO 16 LM/ALSEP\*\*\*\*\*

SPACECRAFT COMMON NAME- APOLLO 16 LM/ALSEP NSSDC ID 72-031C  
ALTERNATE NAMES- ALSEP 16, LEM 16, ROVER 16, 06005, APJLLO 16C

LAUNCH DATE- 04/16/72 SPACECRAFT WEIGHT IN ORBIT- 5040. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

#### SPACECRAFT BRIEF DESCRIPTION

THE APOLLO 16 LUNAR MODULE (LM) CONSISTED OF A LUNAR LANDING CRAFT, A LUNAR ROVING VEHICLE (LRV), AND APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS TO BE LEFT ON THE LUNAR SURFACE AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE DESCARTES HIGHLAND REGION JUST NORTH OF THE CRATER DEJLAND AT 8 DEG 59 MIN 55 SEC S LATITUDE, AND 15 DEG 31 MIN 12 SEC E LONGITUDE. THE ALSEP WAS DEPLOYED AT THE LANDING SITE. THE LRV WAS USED DURING EXTRAVEHICULAR ACTIVITIES (EVA) TO EXTEND THE RANGE OF MANNED LUNAR EXPLORATION. THE NUCLEAR-POWERED ALSEP PACKAGE CONTAINED SEISMIC, MAGNETIC FIELD, HEAT FLOW,



LUNAR SOIL COMPOSITION, SOLAR WIND, AND COSMIC-RAY EXPERIMENTS.

\*\*\*\*\*APCLLC 16 LM/ALSEP, CARRUTHERS

EXPERIMENT NAME- FAR ULTRAVIOLET CAMERA/SPECTROSCOPE NSSDC ID 72-031C-10

ORIGINAL EXPERIMENT INSTITUTION- NAVAL RESEARCH LAB

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - G.R. CARRUTHERS	NAVAL RESEARCH LAB	WASHINGTON, DC
OI - T. PAGE	NASA-JSC	HOUSTON, TX

EXPERIMENT STATUS OF OPERATION- INOPERABLE  
DATE LAST EXPERIMENT DATA RECORDED- 04/24/72

EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT CONSTITUTED THE FIRST PLANETARY-BASED ASTRONOMY OBSERVATORY AND CONSISTED OF A TRIPOD-MOUNTED 3-IN. ELECTROGRAPHIC SCHMIDT CAMERA WITH A CESIUM IODIDE CATHODE AND FILM CARTRIDGE. SPECTROSCOPIC DATA WERE PROVIDED IN THE 300- TO 1350-A RANGE (30-A RESOLUTION), AND IMAGERY DATA WERE PROVIDED IN TWO PASSBANDS (1050 TO 1260 A AND 1200 TO 1550 A). DIFFERENCE TECHNIQUES ALLOWED LYMAN-ALPHA (1216-A) RADIATION TO BE IDENTIFIED. THE ASTRONAUTS DEPLOYED THE CAMERA IN THE SHADOW OF THE LM AND THEN POINTED IT TOWARD OBJECTS OF INTEREST. SPECIFIC PLANNED TARGETS WERE THE GEORONA, THE EARTH'S ATMOSPHERE, THE SOLAR WIND, VARIOUS NEBULAE, THE MILKY WAY, GALACTIC CLUSTERS AND OTHER GALACTIC OBJECTS, INTERGALACTIC HYDROGEN, SOLAR BOW CLOUD, THE LUNAR ATMOSPHERE, AND LUNAR VOLCANIC GASES (IF ANY). AT THE END OF THE MISSION, THE FILM WAS REMOVED FROM THE CAMERA AND RETURNED TO EARTH.

DATA SET NAME- DIGITIZED SCANS OF THE FAR-UV NSSDC ID 72-031C-10B  
CAMERA/SPECTROSCOPE FRAMES ON MAG TAPE

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/21/72 TO 04/23/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 31 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF MAGNETIC TAPES CONTAINING THE DIGITIZED RESULTS OF MICRODENSITOMETERING THE 209 MISSION FRAMES FROM THE APOLLO 16 FAR-UV CAMERA EXPERIMENT OF CARRUTHERS AND PAGE. THESE SCANS WERE ALL PERFORMED ON THE DICOMED MODEL 57 MICRODENSITOMETER USING A SPOT SIZE OF 32 MICRONS AND A SCAN INTERVAL OF 32 MICRONS. THE TAPES CONTAIN A TOTAL OF 476 SCANS. THERE ARE 288 SCANS OF THE 190 MISSION PICTURE FRAMES, 58 SCANS OF THE 19 MISSION CALIBRATION-FRAMES, AND 130 SCANS OF THE SPECIAL FRAMES USED FOR CALIBRATION CONTROL DURING THE SCANNING PROCESS. ALL TAPES IN THIS DATA SET WERE WRITTEN IN BINARY (9-TRACK) AT ODD PARITY AT 200 BPI, AND WERE PACKED AT 8 BITS/BYTE. EACH TAPE CONTAINS MORE THAN ONE FILE. THE TAPES HAVE NO INFORMATION ON THEM OTHER THAN THE DIRECT SCANNING DATA. THE DATA ON THE TAPES ARE BLOCKED OUT IN THE FOLLOWING MANNER -- (1) THE SCAN OF ONE COMPLETE FRAME IS CONTAINED IN ONE FILE. THERE ARE APPROXIMATELY 15 FILES/TAPE. (2) EACH RECORD WITHIN A FILE REPRESENTS ONE SCAN LINE OF DATA RECORDED LEFT-TO-RIGHT. THE FULL SCAN OF ONE MISSION FRAME IS EQUIVALENT TO 1024 RECORDS, AND (3) EACH BYTE (8 BITS) WITHIN A RECORD REPRESENTS THE LIGHT TRANSMITTANCE VALUE RECORDED BY THE SCANNER FOR ONE INCREMENT OF THE SCAN INTERVAL. THE 8-BIT A/D DIGITIZATION ALLOWS FOR A POSSIBLE RANGE FROM

0 TO 255 IN THE RECORDED TRANSMITTANCE VALUES ALONG THE SCAN LINE. THE MAXIMUM NUMBER OF ELEMENTS (BYTES) PER SCAN LINE FOR A MISSION FRAME IS 1024. (NOTE - TO LOCATE THE SCAN OF PARTICULAR FRAMES ON THESE TAPES, AND TO KNOW HOW THAT SCAN WAS PERFORMED REQUIRES USE OF THE NSSDC DATA SET 72-031C-10C. DATA SET 72-031C-10C WILL BE SENT AUTOMATICALLY TO THOSE REQUESTING DATA SET 72-031C-10B.)

DATA SET NAME- CATALOG OF INFORMATION ON MISSION FRAMES NSSDC ID 72-031C-10C  
AND HOW THEY WERE MICRODENSITOMETERED

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/21/72 TO 04/23/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MICROFILM

#### DATA SET BRIEF DESCRIPTION

THIS DATA SET IS A CATALOG COMPOSED OF 476 PAGES SUBMITTED BY DR. T. PAGE TO ACCOMPANY THE MAGNETIC TAPES THAT CONTAIN THE RESULTS OF MICRODENSITOMETERING, USING THE DICOMED MODEL 57 MICRODENSITOMETER. THE 209 MISSION FRAMES GATHERED ON THE LUNAR SURFACE BY THE APOLLO 16 EXPERIMENT - FAR UV CAMERA/SPECTROMETER. THE 209 MISSION FRAMES INCLUDED 190 UV PICTURES AND 19 CALIBRATION FRAMES. A NUMBER OF THESE FRAMES WERE SCANNED MORE THAN ONCE. IN ADDITION, DURING THE PROCESS OF DOING THE MICRODENSITOMETER SCANS, MANY SCANS WERE MADE OF A GRAY-SCALE STEP-WEDGE AS A QUALITATIVE CONTROL VARIABLE ON THE SCANNING PROCEDURE. IN ALL, 476 SCANS WERE MADE, AND THE INFORMATION ON EACH SCAN IS CONTAINED ON A SINGLE CATALOG PAGE. THE NATURE OF THE INFORMATION GIVEN ON EACH SCAN MAKES THIS CATALOG USEFUL FOR THREE PURPOSES -- (1) AS THE SOURCE OF GENERAL INFORMATION ON EACH OF THE MISSION FRAMES, AS THE PAGES GIVE DATA ON CAMERA POINTING, FILTER(S) USED, EXPOSURE TIME, OBJECTS VISIBLE, ETC. (2) AS A USEFUL ADJUNCT TO THE VIEWING OF THE MISSION FRAMES. (3) AS AN ESSENTIAL GUIDE IN DETERMINING THE LOCATION OF THE MICRODENSITOMETER SCAN(S) OF THE MISSION FRAMES ON THE DIGITIZED SCAN DATA TAPES, AND AS THE SOURCE OF INFORMATION ON HOW THE SCANS WERE PERFORMED AND THE SIZE OF THE SCANS. COPIES OF THE MISSION FRAMES, AND THE DIGITIZED-SCAN MAGNETIC TAPES ARE AVAILABLE THROUGH NSSDC AS DATA SETS 72-031C-10A AND 72-031C-10B, RESPECTIVELY.

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SPACECRAFT COMMON NAME- OAO 2  
ALTERNATE NAMES- OAO-A2, OAO-B, 03597

NSSDC ID 68-110A

LAUNCH DATE- 12/07/68 SPACECRAFT WEIGHT IN ORBIT- 2150. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE  
DATE LAST SPACECRAFT DATA RECORDED- 02/14/73

EPOCH DATE- 12/10/68 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100. MIN  
APOAPSIS- 778.000 KM ALT PERIAPSIS- 765.000 KM ALT INCLINATION- 35. DEG

#### SPACECRAFT BRIEF DESCRIPTION

THIS SPACECRAFT WAS ONE OF A SERIES OF AUTOMATED ASTRONOMICAL OBSERVATORIES WHICH WAS GROUND CONTROLLABLE IN ORIENTATION AND WAS PLACED IN A LOW-EARTH ORBIT. THIS SPACECRAFT CARRIED TWO EXPERIMENT PACKAGES. ONE PACKAGE CONSISTED OF FOUR STELLAR PHOTOMETERS (1000-4250 A), TWO SCANNING SPECTROMETERS (1000-4000 A), AND ONE NEBULAR PHOTOMETER (2000-3300 A). THE OTHER PACKAGE CONSISTED OF FOUR INDEPENDENT TELESCOPIC SCHWARZCHILD CAMERAS

{1200-2900 A}.

\*\*\*\*\*OAC 2. WHIPPLE

EXPERIMENT NAME- HIGH-RESOLUTION TELESCOPES

NSSDC ID 68-110A-01

ORIGINAL EXPERIMENT INSTITUTION- SAC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - F.L. WHIPPLE

SAO

CAMBRIDGE, MA

OI - J.F. McNALL

U OF WISCONSIN

MADISON, WI

EXPERIMENT STATUS OF OPERATION- INOPERABLE

DATE LAST USABLE EXPERIMENT DATA RECORDED- 04/30/70

EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT, REFERRED TO AS THE CELESCOPE EXPERIMENT, CONSISTED OF TWO MAJOR SUBASSEMBLIES -- AN OPTICAL PACKAGE CONTAINING FOUR 12-IN. SCHWARZCHILD TELESCOPES THAT USED UVICONS TO PRODUCE TELEVISION PICTURES OF STAR FIELDS AND AN ELECTRONICS PACKAGE. THE UVICONS WERE FITTED WITH FILTERS CONSTRUCTED BY COMBINING HALVES OF FILTER BLANKS. REDUNDANT DATA WERE THEREBY OBTAINED OVER FOUR DIFFERENT PASSBANDS. THESE PASSBANDS WERE FROM 1200 TO 1500 A, 1375 TO 1800 A, 1800 TO 2800 A, AND 2850 TO 3250 A. THE ONLY SIGNIFICANT FAILURE DURING THE 16 MONTHS OF OPERATION WAS CAUSED BY OVEREXPOSING ONE OF THE UVICONS TO SUNLIGHT. THE SENSITIVITY OF THE OTHER UVICONS DECREASED SIGNIFICANTLY BUT IN A CORRECTABLE MANNER, ALTHOUGH THIS DECREASE WAS THE PRIMARY REASON THAT THE OPERATION OF THIS EXPERIMENT CEASED IN APRIL 1970. OVER 8500 2-DEG BY 2-DEG STAR FIELDS WERE OBSERVED, COVERING ABOUT 10 PERCENT OF THE SKY AND YIELDING OBSERVATIONS OF SOME 5000 OBJECTS.

DATA SET NAME- REDUCED OBSERVATIONS OF UV OBJECTS IN  
CATALOG FORM ON MAGNETIC TAPE

NSSDC ID 68-110A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/08/68 TO 04/30/70 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, CONTAINED ON MAGNETIC TAPE, IS THE COMPLETE CELESCOPE CATALOG OF OBJECTS OBSERVED IN THE ULTRAVIOLET REGION. THESE ARE REDUCED DATA SUPPLIED BY THE EXPERIMENTER. THIS CATALOG IS A TABULAR LISTING INCLUDING, FOR EACH OBJECT OBSERVED, (1) THE HENRY DRAPER NUMBER, (2) THE RIGHT ASCENSION/DECLINATION (EPOCH 1950), (3) THE VISUAL MAGNITUDE, (4) THE PHOTOELECTRIC B-V AND U-BV AND UVSS (INCLUDING A PECULIARITY FLAG), (5) THE OBSERVED ULTRAVIOLET MAGNITUDES (FOR THE FOUR PASSBANDS) AND STANDARD DEVIATIONS, (6) THE RIGHT ASCENSION/DECLINATION (EPOCH 2000), (7) THE WEIGHTING VALUES USED TO OBTAIN THE AVERAGE ULTRAVIOLET MAGNITUDES REPORTED, (8) A CODE REFERRING TO THE GENERAL TYPE OF OBJECT OBSERVED (E.G., GALACTIC CLUSTER, RADIO SOURCE, ETC.), (9) CODE(S) INDICATING PHOTOMETRIC PROPERTIES OF THE OBJECT (E.G., VISUAL BINARY, CLASSICAL CEPHEID VARIABLE, NOVA-LIKE VARIABLE), (10) CODES INDICATING SPECTRAL CHARACTERISTICS OF THE STAR (E.G., SPECTROSCOPIC BINARY, PECULIAR A-TYPE SPECTRUM, MAGNETIC FIELD), (11) A REMARKS COLUMN, AND (12) A LISTING OF BIBLIOGRAPHIC REFERENCES. INCLUDED WITH THE DATA SET IS A SET OF PROGRAMS THAT ENABLE THE USER TO SEARCH THE TAPE FOR VARIOUS TYPES OF STARS, AS WELL AS FOR SPECIFIC OBJECTS. THIS TAPE WAS GENERATED ON A CDC SERIES COMPUTER AND IS WRITTEN IN BINARY AT 556 BPI

ON 7-TRACK TAPE.

DATA SET NAME- HARDCOPY CELESCOPE CATALOG OF ULTRAVIOLET ASSOC ID 68-110A-01E  
STELLAR OBSERVATIONS

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 12/07/68 TO 01/00/70 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 1 BACK(S) OR ECUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET, CONTAINED IN ONE HARDBOUND VOLUME, IS THE COMPLETE CELESCOPE CATALOG OF OBJECTS OBSERVED IN THE ULTRAVIOLET REGION. THESE ARE REDUCED DATA PUBLISHED BY THE EXPERIMENTER. THIS CATALOG IS A TABULAR LISTING OF EACH OBJECT OBSERVED AND INCLUDES -- (1) THE HENRY DRAPER NUMBER, (2) THE RIGHT ASCENSION/DECLINATION (EPOCH 1950), (3) THE VISUAL MAGNITUDE, (4) THE PHOTOELECTRIC B-V AND U-B COLORS, (5) THE SPECTRUM AND LUMINOSITY CLASS (INCLUDING A PECULIARITY FLAG), (6) THE OBSERVED ULTRAVIOLET MAGNITUDES (FOR THE FOUR PASSBANDS) AND STANDARD DEVIATIONS, (7) THE RIGHT ASCENSION/DECLINATION (EPOCH 2000), (8) WEIGHTING VALUES USED TO OBTAIN THE AVERAGE UV MAGNITUDES REPORTED, (9) A CODE REFERRING TO THE GENERAL TYPE OF OBJECT OBSERVED (E.G., GALACTIC CLUSTER, RADIO SOURCE, ETC.), (10) CODE(S) INDICATING PHOTOMETRIC PROPERTIES OF THE OBJECT (E.G., VISUAL BINARY, CEPHEID VARIABLE), (11) CODES INDICATING SPECTRAL CHARACTERISTICS OF THE STAR (E.G., SPECTROSCOPIC BINARY, PECULIAR A-TYPE SPECTRUM), (12) A REMARKS COLUMN, AND (13) A LISTING OF BIBLIOGRAPHIC REFERENCES. THIS DOCUMENT, 'THE CELESCOPE CATALOG OF ULTRAVIOLET STELLAR OBJECTS,' BY R. J. DAVIS, W. A. DEUTSCHMAN, AND K. L. HARMUNDAVIS, IS AVAILABLE FROM THE SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., 20402, STOCK NO. 4700--00260 (\$4.50 PLUS POSTAGE).

DATA SET NAME- SOFTWARE TO AID THE USE OF THE MAGNETIC ASSOC ID 68-110A-01F  
TAPE VERSION OF THE CELESCOPE CATALOG

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/08/68 TO 04/30/70 (AS VERIFIED BY ASSOC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE EXPERIMENTER, CONSISTS OF CARD IMAGES, WRITTEN ON 556-BPI, 7-TRACK TAPE, OF THE PROGRAMS DISCUSSED IN THE 'USERS GUIDE TO THE MAGNETIC TAPE VERSION OF THE CELESCOPE CATALOG OF ULTRAVIOLET OBSERVATIONS, BY R. J. DAVIS, ET AL., (816674). THESE PROGRAMS ARE NEEDED TO READ DATA SET 68-110A-01A EASILY, AND ARE SUPPLEMENTAL DATA FOR THAT DATA SET. DESCRIPTIONS OF THIS SOFTWARE ARE TO BE FOUND IN THE ABOVE DOCUMENT.

\*\*\*\*\*OGG 5

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SPACECRAFT COMMON NAME- OGG 5 ASSOC ID 68-014A

ALTERNATE NAMES- OGG-E, EGG 5, EGG 5, 03138, S 59

LAUNCH DATE- 03/04/68 SPACECRAFT WEIGHT IN ORBIT- 611. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE  
DATE LAST USABLE SPACECRAFT DATA RECORDED- 07/13/72

EPOCH DATE- 03/04/68 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 3796. MIN  
APOAPSIS- 148228. KM ALT PERIAPSIS- 232.000 KM ALT INCLINATION- 31.1 DEG

SPACECRAFT BRIEF DESCRIPTION

THE PURPOSE OF THE OGO 5 SPACECRAFT, THE FIFTH OF A SERIES OF SIX ORBITING GEOPHYSICAL OBSERVATORIES, WAS TO CONDUCT MANY DIVERSIFIED GEOPHYSICAL EXPERIMENTS TO OBTAIN A BETTER UNDERSTANDING OF THE EARTH AS A PLANET, AND TO DEVELOP AND OPERATE A STANDARDIZED OBSERVATORY-TYPE SPACECRAFT. OGO 5 CONSISTED OF A MAIN BODY THAT WAS PARALLELEPIPED IN FORM, TWO SOLAR PANELS, EACH WITH A SOLAR-ORIENTED EXPERIMENT PACKAGE (SOEP), AND TWO ORBITAL PLANE EXPERIMENT PACKAGES (OPEP). ONE FACE OF THE MAIN BODY WAS EARTH-POINTING (Z AXIS), AND THE LINE CONNECTING THE TWO SOLAR PANELS (X AXIS) WAS PERPENDICULAR TO THE EARTH-SUN-SPACECRAFT PLANE. THE SOLAR PANELS WERE ABLE TO ROTATE ABOUT THE X AXIS. THE OPEP'S WERE MOUNTED ON AND COULD ROTATE ABOUT AN AXIS THAT WAS PARALLEL TO THE Z AXIS AND THAT WAS ATTACHED TO THE MAIN BODY. AT LAUNCH, THE INITIAL LOCAL TIME OF APCGEE WAS 0944 HR. OGO 5 CARRIED 25 EXPERIMENTS. SEVENTEEN OF THESE WERE PARTICLE STUDIES, AND TWO WERE MAGNETIC FIELD STUDIES. IN ADDITION, THERE WAS ONE EACH OF THE FOLLOWING TYPES OF EXPERIMENTS -- RADIO ASTRONOMY, UV SPECTRUM, LYMAN-ALPHA, SOLAR X-RAY, PLASMA WAVES, AND ELECTRIC FIELD. REAL-TIME DATA WERE TRANSMITTED AT 1, 8, AND 64 KBS DEPENDING ON THE DISTANCE FROM THE SPACECRAFT TO THE EARTH. PLAYBACK DATA WERE TAPE RECORDED AT 1 KBS AND TRANSMITTED AT 64 KBS. TWO WIDE-BAND TRANSMITTERS, ONE FEEDING INTO AN OMNIDIRECTIONAL ANTENNA AND THE OTHER FEEDING INTO A DIRECTIONAL ANTENNA, WERE USED TO TRANSMIT DATA. A SPECIAL PURPOSE TELEMETRY SYSTEM, FEEDING INTO EITHER ANTENNA, WAS ALSO USED TO TRANSMIT WIDE-BAND DATA IN REAL TIME ONLY. TRACKING WAS ACCOMPLISHED BY USING RADIC BEACONS AND A RANGE AND RANGE-RATE S-BAND TRANSPONDER. THE SPACECRAFT ATTITUDE CONTROL FAILED ON AUGUST 6, 1971, AFTER 41 MONTHS OF NORMAL OPERATION. THE SPACECRAFT WAS PUT IN A LOW-POWER MODE ON SEPTEMBER 27, 1971. THE PLAYBACK MODE BECAME INOPERABLE ON AUGUST 26, 1971, AND THE SPACECRAFT WAS PUT IN AN OPERATIONAL OFF MODE ON OCTOBER 8, 1971. THREE EXPERIMENTS WERE REACTIVATED FOR THE PERIOD FROM JUNE 1 TO JULY 13, 1972 (68-014A-09, 68-014A-22, AND 68-014A-27).

\*\*\*\*\*OGO 5, HADDOCK

EXPERIMENT NAME- 50 KHZ TO 3.5 MHZ SOLAR RADIC ASTRONOMY NSSCC ID 68-014A-20  
IN EIGHT STEPS

ORIGINAL EXPERIMENT INSTITUTION- U OF MICHIGAN

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)  
PI - F.T. HADDOCK U OF MICHIGAN ANN ARBOR, MI

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF  
DATE LAST USABLE EXPERIMENT DATA RECORDED- 10/08/71

EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT, USED PRIMARILY TO OBSERVE TYPE-3 SOLAR RADIO BURSTS, CONSISTED OF A 9.12-M MONOPOLE ANTENNA AND A STEP-FREQUENCY SUPERHETERODYNE RECEIVER TUNABLE THROUGH THE EIGHT FREQUENCIES OF 0.05, 0.10, 0.20, 0.35, 0.60, 0.90, 1.80, AND 3.50 MHZ IN 9.2 SEC (1.152 SEC AT EACH FREQUENCY, REGARDLESS OF SPACECRAFT TELEMETRY RATE). THIS EXPERIMENT OPERATED BOTH DURING REAL-TIME COVERAGE AND DURING TAPE-RECORDED COVERAGE. THE EXPERIMENT PACKAGE WAS LOCATED IN SOLAR ORIENTED EXPERIMENT PACKAGE (SOEP) NUMBER 1, WITH THE MONOPOLE ANTENNA ORIENTED PERPENDICULAR TO THE EARTH-SPACECRAFT-SUN

PLANE (+X DIRECTION). THE RECEIVER BANDWIDTH WAS 10 KHZ (6 DB POINTS), AND THE INTERMEDIATE FREQUENCY STAGE HAD AN AUTOMATIC GAIN CONTROL YIELDING A DYNAMIC RANGE OF 44 DB. THE OUTPUT OF THE DETECTOR WAS FILTERED WITH A TIME CONSTANT OF 0.21 SEC. A SOLID-STATE FOUR-LEVEL NOISE GENERATOR WAS CONNECTED IN PLACE OF THE ANTENNA FOR INFLIGHT CALIBRATION EVERY 9.85 MIN (36.9 SEC WERE REQUIRED FOR CALIBRATION). THE RECEIVER OPERATED IN EITHER OF TWO MODES. DURING NORMAL OPERATION, THE RECEIVER WAS STEPPED THROUGH THE EIGHT FREQUENCIES. IN A NONSTEPPING MODE, THE RECEIVER WAS LOCKED ON ONLY ONE OF THE AVAILABLE FREQUENCY CHANNELS. THE RADIOMETER OPERATED IN THE STEPPING MODE EXCEPT FOR THE PERIODS APRIL 25 TO JUNE 18, 1968 (3.5 MHZ), SEPTEMBER 12 TO 14, 1968 (0.6 MHZ), AND DECEMBER 15 TO 17, 1969 (0.6 MHZ). WHEN IN THE STEPPING MODE, THE EIGHT FREQUENCY STEPS CONSTITUTED A SUBCYCLE OF 9.2-SEC INTERVALS. WHEN THE SPACECRAFT WAS OPERATING AT THE 1-KES TELEMETRY RATE, THREE DATA SAMPLES WERE TAKEN DURING EACH FREQUENCY STEP. THESE DATA SAMPLES WERE TAKEN FOR INTERVALS OF 3.31 OR 4.37 POSTDETECTOR TIME CONSTANTS. ONCE DURING A MAIN CYCLE (64 SUBCYCLES OF 9.23 MIN EACH), A CALIBRATION CYCLE (FOUR SUBCYCLES OF EIGHT FREQUENCY STEPS EACH) WAS RUN. BOTH IMPULSIVE AND NONIMPULSIVE INTERFERENCE OCCURRED, WITH THE FOUR LOWEST FREQUENCY CHANNELS USUALLY BEING AFFECTED BY SOME IMPULSIVE INTERFERENCE ASSUMED BECAUSE OF OTHER EXPERIMENTS ON BOARD THE SPACECRAFT. NONIMPULSIVE INTERFERENCE, MANIFESTED AS PERMANENT NOISE LEVELS HIGHER THAN PREFLIGHT RECEIVER NOISE, OCCURRED IN THE CASE OF THE 1.80- AND 0.35-MHZ CHANNELS. THE SYSTEM STABILITY WAS CHECKED APPROXIMATELY EVERY 2 MONTHS FROM MARCH 1968 THROUGH DECEMBER 1969, AND THE OUTPUT LEVELS WERE FOUND TO BE CONSTANT TO WITHIN A FEW PERCENT.

DATA SET NAME- 8-CHANNEL FREQUENCY VS TIME PLOTS OF NSSDC ID 68-014A-20A  
SOLAR RADIO EMISSIONS ON MICROFILM

AVAILABILITY OF DATA SET- DATA AVAILABLE FROM EXPERIMENTER

TIME PERIOD COVERED- 03/05/68 TO 09/24/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 50 REEL(S) OF MICROFILM

#### DATA SET BRIEF DESCRIPTION

THIS DATA SET, RECEIVED FROM THE EXPERIMENTER, CONTAINS PARTIALLY REDUCED DATA ON 35-MM MICROFILM. THE OUTPUT VOLTAGES OF THE EIGHT FREQUENCY CHANNELS ARE DISPLAYED SIMULTANEOUSLY, WITH THE TIME AXIS RUNNING ALONG THE LENGTH OF THE FILM. THE OUTPUT OF THE EIGHT CHANNELS ARE STAGGERED ACROSS THE WIDTH OF THE FILM, WITH THE 3.5-MHZ CHANNEL LOCATED AT THE TOP AND THE SEVEN REMAINING CHANNELS DISPLAYED BELOW IN ORDER OF DECREASING FREQUENCY. THE EIGHT TRACINGS HAVE THE SAME TIME REFERENCE, I.E., A VERTICAL LINE THROUGH ALL TRACES CORRESPONDS TO THE SAME TIME. EACH FRAME ON THE FILM CONTAINS 39 MIN OF DATA. BLANK SPACES BETWEEN FRAMES ARE NOT DATA GAPS BUT ARE DUE TO THE PROCESSING MACHINE USED. EACH FRAME IS LABELLED WITH THE DATE AND START-TIME (UT) FOR THE FRAME, THE NUMBER OF THE INPUT DATA TAPE, AND THE NUMBER OF THE FILE ON THE INPUT TAPE. TICK MARKS ON THE LEFT SIDE INDICATE THE ZERO VOLTAGE LEVELS FOR THE EIGHT OUTPUTS, AND TICK MARKS ALONG THE TIME AXIS INDICATE HALF HOURS. BECAUSE OF THE COMPRESSED TIME SCALE, IN-FLIGHT CALIBRATION SIGNALS APPEAR AS SHORT VERTICAL LINES ABOUT 10 MIN APART. ATTITUDE INFORMATION, IF AVAILABLE, IS ALSO INCORPORATED, INCLUDING TIME MARKS FOR APOGEE AND PERIGEE PASSES. FOR THE PERIOD MARCH 1968 THROUGH JUNE 1969, THE DATA COVERAGE WAS FAIRLY COMPLETE WITH A TOTAL OF 7212 HR. DATA FOR THE PERIOD APRIL 24, 1968, TO JUNE 18, 1968, (NONSTEPPING MODE, 3.5 MHZ) WERE NOT PROCESSED. FOR THE TIME PERIOD BETWEEN JULY 1969 AND FEBRUARY 1970, ONLY SPARSE DATA WERE RECEIVED AND THE TOTAL COVERAGE WAS LESS THAN 2000 HR. DATA AT A PARTICULAR TIME MAY BE MARRED BY IN-FLIGHT CALIBRATIONS, DATA GAPS IN COVERAGE, SPORADIC SPACECRAFT INTERFERENCE, OR IONOSPHERIC NOISE. SELECTED EVENTS HAVE BEEN REPLOTTED BY THE EXPERIMENTER ON LARGE

CALCOMP PLOTS. THESE CALCOMP PLOTS ARE AVAILABLE FOR VIEWING FROM THE  
UNIVERSITY OF MICHIGAN IN ANN ARBOR, MI.

\*\*\*\*\*OSO 7

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SPACECRAFT COMMON NAME- OSO 7 NSSDC ID 71-083A  
ALTERNATE NAMES- OSO-H, 05491  
LAUNCH DATE- 09/29/71 SPACECRAFT WEIGHT IN ORBIT- 1400. KG  
SPACECRAFT STATUS OF OPERATION- PARTIAL  
07/09/74  
EPOCH DATE- 10/02/71 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 93.40 MIN  
APOAPSIS- 571.000 KM ALT PERIAPSIS- 323.000 KM ALT INCLINATION- 33.13 DEG

#### SPACECRAFT BRIEF DESCRIPTION

THE OBJECTIVES OF THE OSO SATELLITE SERIES WERE TO PERFORM SOLAR PHYSICS EXPERIMENTS ABOVE THE ATMOSPHERE DURING A COMPLETE SOLAR CYCLE AND TO MAP THE ENTIRE CELESTIAL SPHERE FOR DIRECTION AND INTENSITY OF UV LIGHT AND X-RAY AND GAMMA RADIATION. THE OSO 7 PLATFORM CONSISTED OF A SAIL SECTION, WHICH POINTED TWO EXPERIMENTS CONTINUALLY TOWARD THE SUN, AND A WHEEL SECTION, WHICH SPUN ABOUT AN AXIS PERPENDICULAR TO THE POINTING DIRECTION OF THE SAIL AND CARRIED FOUR EXPERIMENTS. ATTITUDE ADJUSTMENT WAS PERFORMED BY GAS JETS AND A MAGNETIC TORQUING COIL. A POINTING CONTROL PERMITTED THE POINTED EXPERIMENTS TO SCAN THE REGION OF THE SOLAR DISK IN A 60- BY 60-ARC-MIN RASTER PATTERN. IN ADDITION, THE POINTED SECTION COULD BE COMMANDED TO SELECT AND SCAN ANY 7.5- BY 5-ARC-MIN REGION NEAR THE SOLAR DISK. DATA WERE SIMULTANEOUSLY RECORDED ON TAPE AND TRANSMITTED BY PCM/PM TELEMETRY. A COMMAND SYSTEM PROVIDED FOR AT LEAST 155 GROUND-BASED COMMANDS. ONLY REAL-TIME DATA HAVE BEEN RECEIVED SINCE MAY 1973, WHEN THE SECOND TAPE RECORDER FAILED. THE SPACECRAFT REENTERED THE EARTH'S ATMOSPHERE JULY 9, 1974.

\*\*\*\*\*OSO 7, CHUPP

EXPERIMENT NAME- SOLAR GAMMA-RAY MONITOR NSSDC ID 71-083A-06  
ORIGINAL EXPERIMENT INSTITUTION- U OF NH HAMPSHIRE  
EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)  
PI - E.L. CHUPP U OF NEW HAMPSHIRE DURHAM, NH  
OI - H.P. GILMAN U OF NEW HAMPSHIRE DURHAM, NH  
OI - A.A. SARKADY U OF NEW HAMPSHIRE DURHAM, NH

EXPERIMENT STATUS OF OPERATION- INOPERABLE  
DATE LAST EXPERIMENT DATA RECORDED- 12/25/72

#### EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT MONITORED THE SOLAR HIGH-ENERGY PHOTON (GAMMA RAY) SPECTRUM FROM 0.3 TO 9.5 MEV FOR INTENSITY, TIME VARIATION, AND POSSIBLE LINE EMISSION, PARTICULARLY DURING FLARES. IN ADDITION, SPECIAL ATTENTION WAS PAID TO LINES AT 0.51 MEV, 2.22 MEV, 4.43 MEV, AND 6.14 MEV, WHICH INDICATE THE PRODUCTION OF POSITRONS, NEUTRONS, AND EXCITED NUCLEI IN THE SOLAR ATMOSPHERE. THE INSTRUMENTATION CONSISTED OF A HIGH-RESOLUTION, GAMMA-RAY SCINTILLATION SPECTROMETER MOUNTED IN THE WHEEL SECTION. THE DETECTOR WAS A THALLIUM-ACTIVATED SODIUM IODIDE SCINTILLATION CRYSTAL VIEWED BY A PHOTOMULTIPLIER. IT WAS SURROUNDED BY A SODIUM-ACTIVATED CESIUM IODIDE ANTICOINCIDENCE SHIELD AND PHOTOMULTIPLIER ARRAY, WHICH ALSO PROVIDED

DIRECTIONAL SENSITIVITY. GAMMA RAYS WERE DETECTED IN 377 ENERGY CHANNELS FROM 0.3 TO 9.5 MEV BY A PULSE HEIGHT ANALYZER. FOR CORRELATION PURPOSES IN THE DATA ANALYSIS, A SECONDARY SYSTEM MADE UP OF A THIN THALLIUM-ACTIVATED SODIUM IODIDE SCINTILLATION CRYSTAL AND A PHOTOMULTIPLIER WAS USED FOR DETECTING X-RAYS FROM 7.5 TO 120 KEV. X-RAY PULSES WERE DIVIDED BY A FOUR-CHANNEL PULSE HEIGHT ANALYZER. HIGH-ENERGY SOLAR NEUTRONS (ENERGIES GREATER THAN 30 MEV) COULD BE IDENTIFIED FROM A STUDY OF THE LARGE ENERGY LOSS EVENTS IN THE CENTRAL DETECTOR, AND THEIR CORRELATION WAS PROVIDED WITH A GAIN-CHANGE ATTENUATOR THAT COULD BE CONTROLLED FROM THE GROUND. THE EXPERIMENT WAS OPERATING NORMALLY AS OF OCTOBER 1972.

DATA SET NAME- USC-7 SOLAR X-RAY DATA (7.5 - 120KEV) CN NSSDC ID 71-083A-06A  
TAPES

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 09/30/71 TO 12/31/72 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 19 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS EXPERIMENTER-GENERATED DATA SET CONSISTS OF 9-TRACK IBM-360-COMPATIBLE MAGNETIC TAPE PACKED AT 800 BPI. THE INFORMATION ON THE TAPES IS THE X-RAY COUNTING RATES DETECTED BY THE INSTRUMENT OVER THE PERIOD FROM SEPTEMBER 30, 1971, TO DECEMBER 31, 1972. THE DATA ARE FOR THE FOUR ENERGY INTERVALS FROM 7.5 TO 15 KEV, 15 TO 30 KEV, 30 TO 60 KEV, AND 60 TO 120 KEV. THESE DATA ARE THE UNCORRECTED OBSERVED COUNTING RATES. DATA COVERAGE IS EVENLY DIVIDED AMONG SOLAR COUNTING RATES AND COUNTING RATES OBTAINED FROM THE DAYSIDE OF THE EARTH, THE NIGHTSIDE OF THE EARTH, AND THE CELESTIAL ANTI-SOLAR POINT (25 PERCENT FOR EACH OF THE FOUR). A DESCRIPTION OF THE INSTRUMENT IS GIVEN BY HIGBIE, ET AL, IN IEEE TRANS. ON NUCL. SCI., NS-19, PP 606-612, FEBRUARY 1972.

DATA SET NAME- TAPE OF CSO-7 GAMMA-RAY EXPERIMENTS NSSDC ID 71-083A-06B  
RESPONSE FUNCTION

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 06/12/71 TO 06/17/71 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, OBTAINED FROM THE EXPERIMENTER, IS ON A 9-TRACK, BCD MAGNETIC TAPE PACKED AT 800 BPI. THE DATA ARE OF THE CALIBRATION RUNS MADE WITH THE FULLY LOADED SPACECRAFT AT BALL BROTHERS RESEARCH CORPORATION DURING THE PERIOD FROM JUNE 12 TO 17, 1971. THESE DATA ARE IN THE FORM OF PULSE HEIGHT SPECTRA PRODUCED BY THE INSTRUMENT. EACH SPECTRUM IS OF 400 CHANNELS IN LENGTH. THE SPECTRA WERE TAKEN WITH THE INSTRUMENT IRRADIATED BY GAMMA-RAYS FROM <sup>51</sup>Cr, <sup>137</sup>Cs, <sup>65</sup>Zn, AND <sup>24</sup>Na SOURCES. IN ADDITION, GAMMA-RAY LINES 1.460 MEV (<sup>40</sup>K) AND 2.615 MEV (<sup>228</sup>Th) WERE IMPOSED ONTO THE BACKGROUND. THESE LINES WERE USED TO DETERMINE THE GAIN AND CHANNEL/ENERGY REGISTRATION AS A FUNCTION OF TIME OVER THE 5-DAY STUDY PERIOD. EACH SPECTRUM IS FOR A PARTICULAR CHOICE OF RADIATION SOURCE/INSTRUMENT ELEVATION AND AZIMUTH ANGLES. THE METHODS USED TO PRODUCE THESE SPECTRA AND THE PROCEDURE USED IN CALIBRATING THE INSTRUMENT FROM THESE RESULTS ARE DESCRIBED BY HIGBIE ET AL. 'NUCLEAR INSTRUMENTS AND METHODS' (NORTH-HOLLAND PUBLISHING CO.), 108, PP. 167-176, 1973.



DATA SET NAME- OSO-7 GAMMA-RAY DATA (0.3 - 9.1MEV) ON NSSDC ID 71-083A-06C  
TAPES

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 10/03/71 TO 12/25/72 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 48 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET WAS OBTAINED FROM THE EXPERIMENTER. THE DATA SET CONSISTS OF REELS OF 9-TRACK BCD MAGNETIC TAPE PACKED AT 800 BPI. THE SET GIVES THE GAMMA-RAY PULSE HEIGHT SPECTRA (0.3 TO 9.1 MEV) GATHERED BY THE UNIVERSITY OF NEW HAMPSHIRE INSTRUMENT OVER THE PERIOD OCTOBER 3, 1971, TO DECEMBER 25, 1972. EACH PULSE HEIGHT SPECTRUM IS REPRESENTED BY THE CONTENTS IN 350 TO 380 ENERGY CHANNELS. THE DATA ARE CORRECTED FOR VARIATIONS IN THE GAIN OF THE INSTRUMENT DURING ITS LIFETIME. THE SPECTRA ARE OF THE SUN (25 PERCENT), THE DAYSIDE OF THE EARTH (25 PERCENT), THE NIGHTSIDE OF THE EARTH (25 PERCENT), AND OF THE CELESTIAL ANTI-SOLAR POINT (25 PERCENT). EACH SPECTRUM IS ACCOMPANIED BY MUCH ANCILLARY INFORMATION - STARTING AND END TIMES FOR THE INTEGRATION, POSITIONAL INFORMATION FOR THE SATELLITE, MAGNETIC PARAMETERS, POINTING COORDINATES, VAN ALLEN PARAMETERS, ETC. A DESCRIPTION OF THE INSTRUMENT IS GIVEN BY HIGBIE ET AL., 'IEEE TRANS. ON NUCL. SCI.,' NS-19, PP. 606-612, FEBRUARY 1972.

\*\*\*\*\*SAS-A

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SPACECRAFT COMMON NAME- SAS-A NSSDC ID 70-107A  
ALTERNATE NAMES- SAS 1, EXPLORER 42, UMURU 1, PL-701C, 04797

LAUNCH DATE- 12/12/70 SPACECRAFT WEIGHT IN ORBIT- 315. KG

SPACECRAFT STATUS OF OPERATION- NORMAL

EPOCH DATE- 12/12/70 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 95.7 MIN  
APOAPSIS- 572.000 KM ALT PERIAPSIS- 531.000 KM ALT INCLINATION- 3.04 DEG

SPACECRAFT BRIEF DESCRIPTION

EXPLORER 42 WAS THE FIRST OF A SERIES OF SMALL SPACECRAFT WHOSE OBJECTIVES WERE TO SURVEY THE CELESTIAL SPHERE AND SEARCH FOR SOURCES RADIATING IN THE X-RAY, GAMMA-RAY, UV, AND OTHER SPECTRAL REGIONS. THE PRIMARY MISSION OF EXPLORER 42 WAS TO DEVELOP A CATALOG OF CELESTIAL X-RAY SOURCES BY SYSTEMATIC SCANNING OF THE CELESTIAL SPHERE IN THE ENERGY RANGE FROM 2 TO 20 KEV. THE SPACECRAFT WAS LAUNCHED DECEMBER 12, 1970 FROM THE SAN MARCO PLATFORM OFF THE COAST OF KENYA, AFRICA, INTO A NEAR-CIRCULAR EQUATORIAL ORBIT. THE ORBITING SPACECRAFT WAS IN THE SHAPE OF A CYLINDER APPROXIMATELY 56 CM IN DIAM AND 116 CM IN LENGTH. FOUR SOLAR PADDLES WERE USED TO RECHARGE A 6-AMP-HR EIGHT-CELL NICKEL-CADMIUM BATTERY AND TO PROVIDE POWER TO THE SPACECRAFT AND EXPERIMENT. THE SPACECRAFT WAS STABILIZED BY AN INTERNAL WHEEL, AND A MAGNETICALLY TORQUED COMMANDABLE CONTROL SYSTEM WAS USED TO POINT THE SPIN AXIS OF THE SPACECRAFT TO ANY POINT OF THE SKY. THE ASPECT SYSTEM CONSISTED OF BOTH A STAR AND SUN SENSOR THAT SHARED THE SAME PROCESSING ELECTRONICS. NORMAL OPERATION OF THE SPACECRAFT STARTED ON DECEMBER 18, 1970. DATA WERE STORED ON A ONE-ORBIT STORAGE TAPE RECORDER AND TELEMETERED DURING A 3.4-MIN PLAYBACK CYCLE. A 1000-BPS PCM/PM SYSTEM WAS USED. AFTER DECEMBER 27, 1970, THE SUN SENSOR WAS NOT EFFECTIVE BECAUSE THE SPIN AXIS OF THE SPACECRAFT WAS MAINTAINED WITHIN 30 DEG OF THE SUN DUE

TO HEAT PROBLEMS. THIS RESTRICTION RESULTED IN A MODIFICATION OF THE ORIGINAL OBSERVING PROGRAM. THE TAPE RECORDER FAILED ON JANUARY 23, 1971. ONLY REAL-TIME DATA FROM BACKUP GROUND STATIONS WERE AVAILABLE AFTER JANUARY 23, 1971. THE STAR SENSOR FAILED IN NOVEMBER 1971. THE SPACECRAFT BATTERY FAILED IN EARLY APRIL 1973. SINCE THAT TIME THE SPACECRAFT HAS OPERATED ON SOLAR POWER ONLY AND HAS PRODUCED TWO TO THREE USABLE FRAMES OF DATA PER DAY.

\*\*\*\*\*SAS-A, GIACCONI

EXPERIMENT NAME- ALL-SKY X-RAY SURVEY

NSSDC ID 70-107A-01

ORIGINAL EXPERIMENT INSTITUTION- HARVARD COLLEGE OBS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - R.	GIACCONI	HARVARD COLLEGE OBS	CAMBRIDGE, MA
OI - E.M.	KELLOGG	HARVARD COLLEGE OBS	CAMBRIDGE, MA
OI - H.	GURSKY	HARVARD COLLEGE OBS	CAMBRIDGE, MA
OI - H.	TANANBAUM	HARVARD COLLEGE OBS	CAMBRIDGE, MA

EXPERIMENT STATUS OF OPERATION- PARTIAL

EXPERIMENT BRIEF DESCRIPTION

THE X-RAY INSTRUMENT ABOARD SAS-A (EXPLORER 42) CONSISTED OF TWO SIDES THAT WERE NEARLY IDENTICAL, BOTH PHYSICALLY AND ELECTRONICALLY. EACH SIDE CONTAINED AN X-RAY DETECTION SYSTEM COMPOSED OF A COLLIMATOR, PROPORTIONAL COUNTERS, ASSOCIATED PROCESSING ELECTRONICS, AND AN ASPECT SENSING SYSTEM. THE HIGH-RESOLUTION (SPATIAL) SIDE HAD A VIEWING ANGLE OF 0.5 DEG X 5 DEG FWHM, AND A DETECTION RANGE FROM 1 TO 20 KEV. THE OTHER SIDE HAD A HIGH-SENSITIVITY (INTENSITY) COLLIMATOR WITH A VIEWING ANGLE OF 5 DEG X 5 DEG FWHM. THIS SIDE HAD A DETECTION RANGE FROM 1 TO 10 KEV. THE CENTERS OF THE FIELDS OF VIEW OF THE TWO BANKS WERE DISPLACED FROM THE EQUATORIAL PLANE OF THE SATELLITE SUCH THAT THE FULL BANDWIDTH COVERED BY THE TWO DETECTORS DURING EACH SPIN WAS APPROXIMATELY 127 DEG. SIX PROPORTIONAL COUNTERS COMPOSED OF A BERYLLIUM SHELL WITH 2.5-MIL BERYLLIUM FOIL WINDOWS WERE BEHIND EACH COLLIMATOR. THE INTERIOR CONTAINED A 2-MIL TUNGSTEN ANODE WIRE AND A GAS COMPOSITION OF 90 PERCENT ARGON, 9.5 PERCENT CARBON DIOXIDE FOR QUENCHING, AND 0.5 PERCENT HELIUM AT A PRESSURE OF 940 MM OF MERCURY. A SET OF LOW-INTENSITY RADIOACTIVE SOURCES WERE USED FOR IN-FLIGHT CALIBRATION OF THE INSTRUMENT. THE SPIN AXIS OF THE SPACECRAFT WAS HELD FIXED IN THE SKY FOR ABOUT A DAY AT A TIME. DURING THIS PERIOD A BAND OF APPROXIMATELY 10 DEG ABOUT THE EQUATOR OF THE SPIN AXIS WAS SCANNED. THE PRIMARY DATA REDUCTION OBJECTIVE WAS TO SUPERIMPOSE THE X-RAY DATA RECORDED AS 'COUNT RATE VS TIME' TO 'COUNT RATE VS AZIMUTH' SO THAT THE SUPERIMPOSITION DATA WOULD BE EQUIVALENT TO A SINGLE SWEEP THROUGH THE OBSERVING 10-DEG BAND WITH A TOTAL OBSERVING TIME OF ONE DAY. AN ARRAY WAS CREATED OF X-RAY SUPERPOSITION (REPRESENTING THE 360-DEG CIRCLE SCANNED) BROKEN INTO 4320 ELEMENTS OF AZIMUTH OF FIVE MINUTES EACH FOR THE 0.5-DEG DETECTOR AND 1080 ELEMENTS OF AZIMUTH OF 20 MINUTES EACH FOR THE 5-DEG DETECTOR. NSSDC EXPECTS TO RECEIVE THE DAYTIME DATA AND THE 1972-1973 DATA IN THE FUTURE.

DATA SET NAME- SOURCE LIBRARY TAPE

NSSDC ID 70-107A-01B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- / / TO / / (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF TAPE, WRITTEN IN 9-TRACK BINARY AT 800 BPI, CONTAINING THE SOURCE LANGUAGE LISTINGS OF THE SAS 1 COMPUTER PROGRAMS USED TO PRODUCE THE DAILY SUMMARY DATA. THE PROGRAMS ARE DESIGNED TO RUN ON IBM 360/65, 360/75, OR 360/95 COMPUTERS. THESE PROGRAMS CAN BE USED FOR FURTHER PROCESSING OF THE DATA, USING DIFFERENT CONTROL PARAMETERS OR A NEW PROGRAM WRITTEN TO ACCOMPLISH THE SPECIALIZED NEEDS OF THE USER.

DATA SET NAME- DAILY SUMMARY DATA ON TAPE

NSSDC ID 70-107A-01C

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/19/70 TO 01/22/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 95 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONTAINS THE NIGHTTIME SUMMARY DATA UP TO THE TIME OF STAR-SENSOR FAILURE IN NOVEMBER 1971. EACH TAPE CONTAINS THE DATA CORRESPONDING TO ONE SCAN OF THE SKY WITH THE SPIN AXIS OF THE SPACECRAFT FIXED. THESE TAPES ARE IMAGES OF A 2314-TYPE DISK CONTAINING A SERIES OF 21 FILES. THE FILES APPEAR IN THE FOLLOWING FORMAT -- (A) PROCESSING STEP THAT CREATED THE FILE, (B) NAME OF THE FILE, AND (C) STARTING ORBIT NUMBER OF TELEMETRY DATA GROUPS. DETAILS ON THE VARIOUS FILES CAN BE OBTAINED FROM THE DOCUMENTATION ASSOCIATED WITH THE DATA SET.